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XXII. *Two Theorems*, by Edward Waring,  
M. A. Lucasian Professor of Mathematics in the University of Cambridge, and  
F. R. S. In a Letter to Charles Morton,  
M. D. Sec. R. S.

T H E O R E M A I.

F I G U R A I.

Read April 25, 1765. **I**N datâ Ellipsi inscribantur duo ( $n$ ) Laterum Polygona  $abcde$ , &c. et  $pqrst$ , &c. ad Puncta respectiva  $a, b, c, d, e$ , &c.  $p, q, r, s, t$ , &c. ducantur Tangentes AB, BC, CD, DE, &c. et PQ, QR, RS, ST, &c. et sint

$\angle abB = \angle cbC$ ,  $\angle bcC = \angle cdD$ ,  $\angle cdD = \angle edE$ , &c. et  $\angle pqQ = \angle qrR$ ,  $\angle qrR = \angle srS$ ,  $\angle srS = \angle tsT$ , et sic deinceps.

Et erit Summa Laterum  
 $ab + bc + cd + de + \&c. = pq + qr + rs + st + \&c.$

F I G U R A 2.

Cor. Ducatur in Ellipsi Polygonum  $abcde$  &c. ( $n$ ) Laterum Methodo supra traditâ; inscribatur etiam aliud Polygonum  $abklm$  &c. ( $n$ ) Laterum quovis alio

alio Modo, cujus unus Angulus ponitur ad Punctum  
(a), et Summa  $ab + bc + cd + de + \&c.$  major  
est quam Summa  $ab + bk + kl + lm + \&c.$

## THEOREMA II.

### TAB. IV. FIGURA I.

Describantur circa datam Ellipsim duo ( $n$ ) La-  
terum Polygona ABCDE &c. et PQRST &c.  
quorum Puncta Contactuum respective sunt  $a, b, c, d, e,$   
&c. et  $p, q, r, s, t,$  &c.

Et sint

$$\overline{\text{Tang.} + \text{Seca. Comp.} \angle aBb} : \overline{\text{Tan.} + \text{Seca. Comp.} \angle cCb} :: bC : bB, \text{ et}$$

$$\overline{\text{Tang.} + \text{Seca. Comp.} \angle cCb} : \overline{\text{Tan.} + \text{Seca. Comp.} \angle cDd} :: cD : cC, \text{ et}$$

$$\overline{\text{Tang.} + \text{Seca. Comp.} \angle cDd} : \overline{\text{Tan.} + \text{Seca. Comp.} \angle eEd} :: Ed : aD \&c.$$

Et sic

$$\overline{\text{Tang.} + \text{Seca. Comp.} \angle pQq} : \overline{\text{Tan.} + \text{Seca. Comp.} \angle qRr} :: qR : qQ, \text{ et}$$

$$\overline{\text{Tang.} + \text{Seca. Comp.} \angle qRr} : \overline{\text{Tan.} + \text{Seca. Comp.} \angle sSr} :: sR : rR, \text{ et}$$

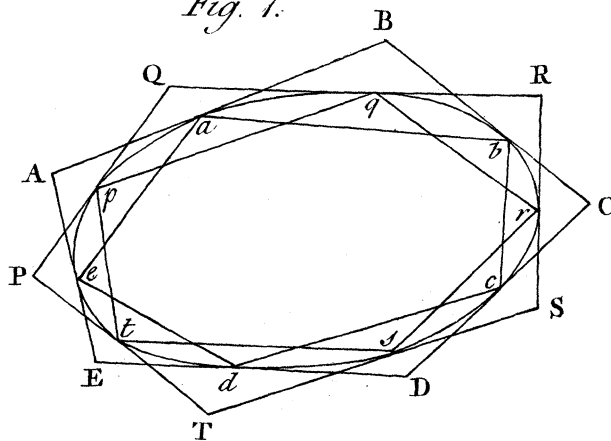
$$\overline{\text{Tang.} + \text{Seca. Comp.} \angle sSr} : \overline{\text{Tan.} + \text{Seca. Comp.} \angle tTs} :: Ts : sS, \text{ et sic deinceps.}$$

Et erit Summa Laterum

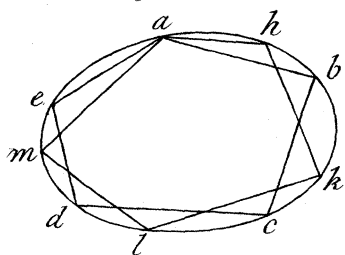
$$AB + BC + CD + DE + \&c. = PQ + QR + RS + ST + \&c.$$

FIGURA

*Fig. 1.*



*Fig. 2.*



*Fig. 3.*

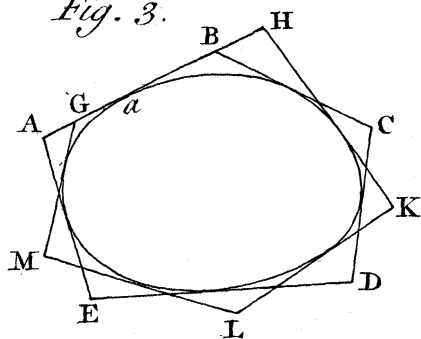


FIGURA 3.

Cor. Describatur circa Ellipsim Polygonum ( $n$ ) Laterum A B C D E, &c. Methodo, quæ prius data fuit; Describatur etiam circa Ellipsim aliud Polygonum G H K L M, &c. ( $n$ ) Laterum quavis aliâ Methodo, cujus unum Punctum Contactus ( $a$ ) est Punctum Contactus Polygoni A B C D E, &c.

Et Summa A B + B C + C D + D E + &c. minor erit quam Summa G H + H K + K L + L M + &c.

Consimiles Proprietates affirmari possunt de Polygonis Hyperbolas descriptis, &c.